Fabrication of Radar Array Antennas Using Large-Area, High-Resolution Lithography-on-Flex, Phase II

Completed Technology Project (2005 - 2007)

Project Introduction

As the important role of NASA "missions to earth" has been clearly demonstrated in recent years, the need for radar antenna systems that have large fields of coverage has gained increased emphasis. In order to achieve the desired performance from space, the antenna systems must have surface areas that are hundreds of square meters in size. However, to make it affordable to deploy such large-area antennas into space, it is necessary to fabricate these antennas on flexible substrates, which are lightweight, and can be rolled into small volumes. The fabrication of flexible antennas calls for new manufacturing techniques that are capable of addressing the challenges of patterning high-resolution features on very-large area flexible substrates, while achieving precise registration of the antenna features over the entire substrate area. In this Phase II proposal we will develop and demonstrate processes to fabricate large-area antennas on flexible substrates, focusing, in particular, on JPL's 2 x 3 m active membrane phased array radar; and we will fabricate the flexible panels required for JPL's antenna. The fabrication of the array antenna will be performed using Anvik's novel large-area roll-to-roll photolithography technology, which enables high-resolution and micron-level registration on large-area flexible substrates.

Primary U.S. Work Locations and Key Partners

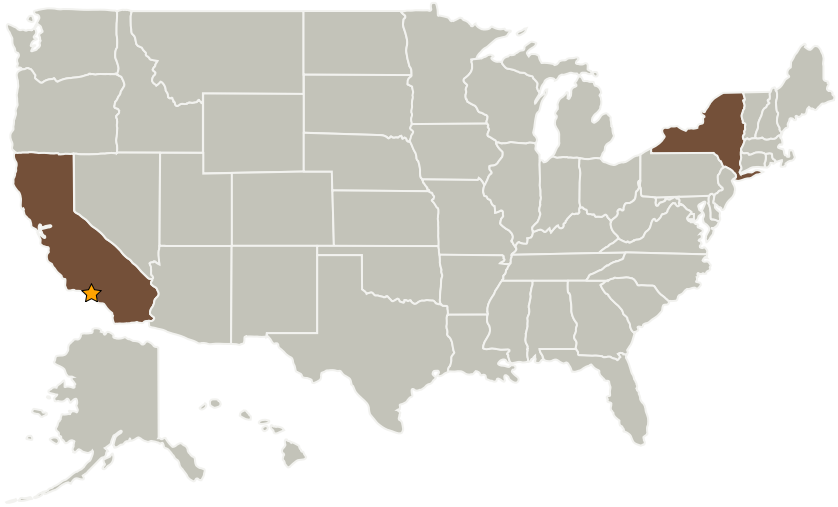

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Table of Contents

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Jet Propulsion Laboratory (JPL)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Jet Propulsion Laboratory(JPL)	Lead Organization	NASA Center	Pasadena, California
Anvik Corporation	Supporting Organization	Industry	Hawthorne, New York

Primary U.S. Work Locations	
California	New York

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.2 Observatories
    - TX08.2.2 Structures and Antennas